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# Prison taps geothermal aquifer

## Savings amount to $1.5 million or more, officials say

**By Dave Anderton**
Deseret Morning News

UTAH STATE PRISON — A vast underground aquifer of near-boiling water is saving Utah taxpayers hundreds of thousands of dollars.

The geothermal reservoir — located roughly 1,000 feet beneath the Utah State Prison — has been tapped as an alternative energy source to provide heat and hot water to hundreds of inmates.

By the time the second phase of the project is completed in 2005, savings in natural gas costs alone will amount to $190,000 annually, said Bruce Munson, account executive for Milwaukee-based Johnson Controls Inc., the company responsible for building the project.

"All of this heat is basically free from Mother Earth," said Mike Glenn, program specialist for the Utah Energy Office.
*Chris Bergin, Deseret Morning News*

"It's a guaranteed contract," Munson said. "In the event we don't save them $190,000 a year, we will write them a check for the difference."

In fact, during the first phase of construction — from July 2003 to July 2004 — roughly $238,000 in savings in electrical, natural gas and water costs were realized.

And since the pump became operational in January, the underground reservoir has been responsible for providing hot water and heating to the four Oquirrh medium security buildings, which house 576 inmates.

By next year the project's benefits will extend to a special service dorm, a furniture and sewing shop and the Wasatch facility, which has 846 inmates.

The $11.5 million project will be paid back over 16 years from savings in utility costs.

"All of this heat is basically free from Mother Earth," said Michael Glenn, program specialist for the Utah Energy Office, which oversees energy efficiency programs for state buildings. "This is the best investment for the Utah taxpayer."

Back in 1951, when the first 600 inmates were transferred from Sugar House Prison to the new facility, the thought of a geothermal energy source at the prison was as remote a concept as the prison itself.

"They decided this would be the best place to build the prison because nobody was around here," said Jack Ford, a spokesman for the Utah Department of Corrections. "It wasn't a built-up

Facilities coordinator Doug Wright releases a valve on the geothermal hot water source at the Utah State Prison Tuesday.
*Chris Bergin, Deseret Morning News*

community, which it now is 50 years later."

Yet had the prison been situated about a quarter mile to the south or to the north, said Bob Blackett, a senior geologist with the Utah Geological Survey, the benefits of the geothermal reservoir could have been lost.

"They are pretty much point sources," Blackett said. "They're not very laterally extensive."

The underground water travels through faults and fractures in deep circulation patterns where it is heated by the Earth's normal geothermal gradient.

"Once that water gets hot then it becomes buoyant, and it comes up along faults," said Susan Lutz, a research scientist specializing in geothermal systems at the University of Utah's Energy and GeoScience Institute. "They've had two wells that are right next to each other, and one's hot and one's cold. It really is related to where that fault is and where that water is coming up along the fault."

About 13 sites in Utah, Blackett said, use geothermal sources for commercial operations.

"A number of direct uses in the state are for greenhouse heating," Blackett said. "There is actually one right next to the prison."

The 185-degree geothermal water is pumped to the surface, where it is forced through a heat exchanger, which transfers a portion of the heat to a separate culinary water system. From there, the heated culinary water is used as hot water in showers and as a source for heating air in traditional forced-air heating systems.

The geothermal water is transported to a nearby holding pond for cooling, eventually making its way into the Jordan River. The Utah Department of Transportation has plans to turn the cooling pond area into a wetland habitat.

The savings in utility costs have allowed the prison to upgrade outdated lighting and old heating, ventilation and air conditioning systems, savings amounting to more than $1.5 million.

The 185-degree geothermal water is pumped to the surface and is transferred to a separate culinary water system for use at the prison.
*Chris Bergin, Deseret Morning News*

Doug Wright, facilities coordinator for the Department of Corrections, said the prison also is saving about 1 million gallons a year in water due to water-saving shower heads and toilets.

By next year at this time, Munson said, the annual savings in electrical, natural gas and water costs will reach roughly $709,000.

"Part of the reason why this can be so successful is this is a long-term relationship," Glenn said. "They've guaranteed savings on this project for more than the first year or second year. With the geothermal, we're looking at Johnson Controls standing behind this project for 20 years and making sure it works."

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